CUSTOM ORTHODONTIC APPLIANCE FORMING METHOD AND APPARATUS

Abstract of the Disclosure:

A system (10) and method by which an orthodontic appliance (25) is automatically designed and manufactured from digital lower jaw and tooth shape data of a patient provides for the scanning of the mouth of a patient (12) , preferably from a model (20) of the patient's mouth, to produce a three-dimensional digitized model (26) of the shapes of the patient's teeth and their positions in the patient's mouth. Then a computer (30) calculates the post-treatment positions of the teeth and produces three-dimensional images of the teeth, individually and in their calculated positions. An interactive computer link between the doctor's office (11) and the appliance manufacturing facility (13) allows an orthodontist (14) to control the patient's archform and to modify the suggested computer-determined positions and orientations of the teeth in six degrees of freedom, and to experiment with new positions, extractions, over-corrections and other variations, with the computer recalculating the tooth positions with high precision for the approval of the orthodontist. The appliance is automatically designed according to the final design, which also can be interactively modified and approved by the orthodontist, with the computer recalculating the effects on the treatment as a result of the doctor's changes. Brackets (81) are fabricated as an integrated set, either by cutting slots therein or by building the brackets in layers by, for example, stereo lithography. Three-dimensional custom jigs (87) are automatically made to exactly position the brackets on a patient's teeth.